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THE HOPELESSNESS OF THE INVISIBLE HAND: SMALL VERSUS LARGE FISHING VESSELS IN HAWAII

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PREFACE

This paper was prepared for presentation at the 1984 meeting of the Western Association for the Valuation of Ecosystems held in Avalon, California on October 4, 1984. It was part of a session entitled "Is Small Beautiful? A Discussion of Disaggregation or By-Community Analysis of Fishery Impacts." The paper is an opportunity to describe Hawaii's commercial fishery and its management climate in a nontechnical manner and to apply a simple analytical structure to recent changes in the fishery. In the latter regard, interpretations of the nature of Hawaii's economic and political development and the ideas pertaining to possible management measures are those of the author and do not represent the views of the National Marine Fisheries Service.

ABSTRACT

Hawaii's commercial fisheries were historically of small scale. However, in the past 10 years there has been an intrusion of large-scale capital that has threatened to upset a long-term social balance in the fishery. The paper describes the large and small capital sectors, analyzes their contribution to social welfare, and suggests a division of the fishery into zones based on harvesting capacity.

INTRODUCTION

The idea that "small is beautiful" has been contested by the song "Short people have no reason for living." Neither explains the impact of different scales of production on modern society. Like most technical analysis, the ideas behind "appropriate technology" and "contestable markets" (to take two ends of of the spectrum) are informed by a background perception of deeper structural problems. In this case the current scale of production and business organization is seen as either inefficient or socially disruptive, or may become so if scale changes during the process of economic growth and development. Unfortunately most types of scale analysis are undertaken without adequate consideration of the interplay of social and political relationships which constrain possible solutions to the underlying structural problem. An example is fisheries management in Hawaii where new fishing enterprises with large amounts of harvesting or financial capital are upsetting a long-term social balance in a commercial fishery based on small-scale capital.

The "small is beautiful" concept of Ernst Schumacher emphasized the importance of social dimensions in economic decisions. The efficiency criteria were to be balanced against criteria based on human relationships and community development. Schumacher was also tilting against mainstream economics in its emphasis on efficiency criteria in market allocations. Ironically, the free enterprise norm of microeconomics is based on a "small is beautiful" perception that a large number of small self-interested producers can generate a social optimum, i.e., Adam Smith's idea of the market as an invisible hand guiding the production and distribution of commodities. Fisheries economists long ago concluded that this was not so for common property resource use, but in the current regulatory climate, contests between an interventionist regulatory approach to fisheries management and a government-wide orientation toward laissez-faire may be one sided. However this climate seems to incorporate consideration of decentralized political authority, and this avenue may provide a route for equitably resolving conflict between large- and small-scale capital in Hawaii's fisheries.

The economies of large-scale fishing capital are naturally limited in Hawaii by the small domestic (local) fresh fish market and by the smallness of nearby resources. Small-scale fishing capital is also limited by the fresh fish market, further constrained by access to loanable funds for working capital, and by the even narrower range of resources reachable by small vessels. Since Hawaii's fishing boats have access to nearby and midwater resources, and since export markets exist for some of these seafood products, there appears to be the basis for a political settlement in the conflict between large and small capital based on a division (allocation) of the nearby and midwater fisheries, and by limits to harvesting capacity and marketing shares for the nearby fishery.

Hawaii is geographically an idyllic place, although biologically its oceans are relatively barren due to its steep volcanic slopes. Hawaiians have a traditional association with the sea, and it is a tradition which

has been extended by the more recent immigrants to these islands. Although only a few people actually are engaged in full-time commercial fishing (probably <500), many more (as many as 25% of Hawaii's population) undertake recreational, part-time commercial, or subsistence fishing. Seafood consumption is an integral aspect of Hawaii's culture, some of the interest coming from Polynesian traditional use of nearshore and reef species and some from Japanese culinary tastes in tunas and deepwater bottom fish. As a result of cultural adaptation by the rest of the population and energetic promotion in tourist restaurants, per capita seafood consumption in Hawaii is high (10-15 kg per person), and almost half of it is fresh fish.

Fishing has also been an important bridge into commercial society in Hawaii for individuals in several immigrant groups, from the Japanese and Portuguese at the turn of the century to Koreans and North Americans in the last 20 years. Seafood markets have also played a role in the initial accumulation of capital destined for investment in less risky businesses. The tuna cannery has played an important social role by providing income to those excluded from the skilled labor pool. Fishing has also been important in tourism, especially for Kailua-Kona, through the promotion of sports fishing, and charter boat fishing is a fairly visible part of the local scene.

The association of Hawaii's people with the sea is not unusual; many societies, including various seaport communities in the U.S. mainland, have strong links to the harvest of the oceans even when the fishery is small. However, for an industrialized society, Hawaii expresses two apparent differences: there is relatively little separation between the harvester and the consumer; and the public associates Hawaii's fisheries with highly politicized coastal zone and environmental issues. As a result, people throughout Hawaii (and not just in isolated or pocket communities) pay attention to the fishery and believe they have a stake in its progress. This contributes to a widening of the political economy of fisheries development and management, even if the public calculus is no more visible in Hawaii than elsewhere. These factors, combined with the geographical concentration of commerce and politics in Hawaii, mean that collective management of the fishery is possible, although it will involve a change in political practices.

For those readers sitting on a continent, some common misperceptions about life in "paradise" should be dispelled. First, the population density of Honolulu approaches that of Los Angeles and the Island of Oahu (upon which Honolulu sprawls) has a population density greater than New Jersey, the most densely populated state. On Oahu, <50% of the housing units are single family structures, and over 20% of the housing structures have four or more stories. These factors point to the urbanization of Oahu and contribute to the usual problems of urban living. Rural Hawaii still exists and it is important to some fishing communities, but most of Hawaii's fisheries come from typically industrial and modern recreational models. Second, as much as 10% of the de facto population at any time is tourist, and over 15% is military-related. Although the issue is hotly debated, there is a definite alienation between parts of the local population and the tourist and military communities, even if the latter two

provide employment. Much has been made of Hawaii as an ethnic melting pot, and in many ways this is quite true. Over 10% of the population is foreign born and probably over 20% is of mixed ancestry. The largest ethnic group, Caucasians, make up just more than one-third of the population. However, there is an ethnic identification and hierarchy that shocks many people within and outside Hawaii. Sometimes the melting pot becomes quite warm. The result is an uneasy acceptance of transients in the fishing industry, a factor also linked to ethnic rivalry. Third, Hawaii's real per capita income rose <5% from 1970 to 1982, while the real cost of living for a typical family has risen approximately 15% over the same period. The ratio of Hawaii's per capita income to the U.S. average fell from 115 to 107%, and the cost of living is 32% above the U.S. average. While Hawaii was a boom society in the 1960's and early 1970's, it is not so today. A dual labor market and a bimodal distribution of income is beginning to affect all productive sectors. The greatest impact in the fishery may be on the availability of labor for the older style fishing boats where crew turnover is increasing and labor productivity declining. Finally, fisheries production is an extremely small share of gross state product, <1%. Any aggregate impact of Hawaii's fisheries is minor compared to other sources of income.

This is to say that Hawaii is like any other state, or at least like any other modern urban state, and its fisheries are not unlike many throughout the mainland U.S. But of course there are differences. The primary difference has to do with geographical isolation and the impact of Hawaii's pattern of economic development and political control on fisheries development and management. The implications of Hawaii's geographical isolation are obvious whereas the economic and political factors pertain to Hawaii's history as an independent republic and more recently as a less than independent territory of the United States. Economically, Hawaii has faced a century of wildly uneven development, and its current industrial structure depends on outside investment, external marketing, and considerable public infrastructural support. To a large extent, these activities have been supported by a coalition of business and professional political interests and legitimized as the sole source of new employment in a changing economy. Propositions such as a hotel room tax are not even seriously heard in the political arena. Therefore, there has been a tendency to emphasize a localist attitude toward political decisions on those issues which can be controlled by Hawaii residents. At the same time, the expansion of markets, the adoption of new technologies, and the mobility of local capital have been more limited than many would prefer. In less polite terms, Hawaii often seems parochial to outsiders while to many local people the predominance of outside capital seems to be a pervasive influence. Many people who have analyzed social conditions in Hawaii believe that there are wider lessons to be learned from this concentrated social and economic structure. Although Hawaii seems to be a very different society compared to American Samoa and Guam (its two closest U.S. relatives in the Pacific), lessons are already being taken from Hawaii's development pattern by those territories. Elsewhere in the Pacific the patterns of development are myriad and the usual economic development controversies are argued. The lesson of Hawaii's post-World War II

fisheries development pertains to the role of small-scale capital in a society shaped by expanding world markets and world centers of production.

The framework for this discussion of the political economy of Hawaii's commercial fishery involves a pattern of limited capital movement and investment and a pattern of political control that has encouraged relatively small fishing enterprises to the exclusion of larger ones, in an economy and a polity whose overall dimensions are dominated by the investment decisions of multinational corporations. Similar patterns exist in other marginally productive sectors in Hawaii such as diversified agriculture. The result seems to have been a compromise against maximum productivity of Hawaii's small natural resource base in favor of widespread access of residents to these resources and the resultant gain of a number of life-style benefits obtained from such participation.

The means for this compromise are a part of Hawaii's post-World War II political history, and in particular the 1954 "revolution" in which political power shifted from the older Caucasian ruling elite to the then newly enfranchised (and subsequently capitalized) residents of Japanese ancestry. The political development of this new class, and its incorporation into a multiethnic middle and small business class, reduced the political leverage of old plantation capital. In the 1960's the inflow of U.S. mainland financial capital (in the form of hotel and tourist center development) created an external [to Hawaii] focus to economic decision making. An attempt to maintain a semblance of local control led to the "politics of the small," i.e., pluralistic democracy in secondary and marginal economic sectors. This bipolar political-economic situation created the conditions for significant levels of local authority in commercial fishing.

This compromise has only really mattered in the past 10 years when recreational and part-time commercial fishing pressure on the nearshore resource began to strain some fish stocks upon which the local commercial fisheries depended, when the loss of existing fisheries seemed possible, and when new physical and financial capital began to enter the fishing industry. Evidence from the application of the State's Fishery Development Plan (1979) clearly shows that failing to differentiate strata of industry not only leads to political problems in implementation of development programs but also misjudges the potential aggregate impact of development and management proposals. By-community impacts of industrial development have strong political ramifications.

HAWAII'S FISHERY

Hawaii's fishery has always emphasized a fresh product, corresponding to a high local demand for sashimi (raw fish, primarily tuna), red bottom fish, and nearshore and reef fish. Hawaii's mid-Pacific tuna fishery, which lands 80% of the entire commercial seafood harvest in the State, utilizes two traditional Japanese harvesting practices: longline for yellowfin tuna, Thunnus albacares, and bigeye tuna, T. obesus (ahi), and live bait, pole and line for skipjack tuna, Katsuwonus pelamis (aku). The ahi is sold fresh and the aku catch is split between the fresh market and the cannery. Both fleets are composed on average of older vessels. The

longline boats average 55 feet in length, and the aku vessels average 70 feet. Longline sampans use crews of three or more whereas aku sampans are clearly more labor intensive and have crews frequently exceeding 10. The deepsea bottom fish (snappers (Lutjanidae) and groupers (Serranidae)) and akule, Selar crumenophthalmus (pelagic mackerel), fisheries use smaller crews, the former being a handline fishery and the latter a handline and surround net fishery. Both are fresh product fisheries. The handline and net vessels are even smaller than the tuna vessels, with a "mosquito" fleet plying the main Hawaiian Islands average 30 feet in length. These vessels are crewed by one to three people. Vessels were owned by individuals or small partnerships, evidently funded through families or groups of close friends (hui's). Although conditions on fishing boats are not always optimal, commercial fishing marked an independence from the plantation life-style that dominated Hawaii before the war, and today fishing continues to provide an alternative life-style with a relative degree of independence. Both the vessels and their ownership patterns are clearly small scaled.

Most local vessels have tended to work fairly close to the main Hawaiian Islands, although some plied the Northwestern Hawaiian Islands (NWHI), an isolated string of islets and reefs stretching 1,500 miles north of Kauai, itself a 200-mile sail from Honolulu (Fig. 1). The aku vessels usually are limited to 1-day trips off Oahu by the mortality of their bait, whereas the longline and bottom fish vessels take trips of <2 weeks, but they too generally remain close to the main islands, although some go farther afield. In other words, the scope and range of fishing grounds were fairly small before the recent exploration of the NWHI by newer, larger, more capital-intensive vessels. Development of mid-Pacific tuna and other pelagic resources was limited by capital availability, marketing, and technology.

Throughout the entire postwar period (if not before), Honolulu has been the dominant seafood market and this continues today--Honolulu has 80% of the population and the only large-scale seafood processing facility. The seafood market consists of the tuna cannery, at which prices are negotiated for skipjack tuna at something below the world price, and a vast array (for Hawaii) of small and medium size seafood dealers. Most of the fresh fish passes through two wholesaler auctions, one in Honolulu and one in Hilo (on the Island of Hawaii, known as the Big Island). These auctions, particularly the United Fishing Agency on Oahu, have provided a highly concentrated source of fresh fish transactions. Although the auctions have been the subject of considerable folklore, and the overall market could not be considered perfectly competitive, the prices received by the commercial fishing operators for fresh seafood far exceed mainland U.S. standards. The noncompetitive aspects of the marketing system could be characterized as "contestable competition" in which transactions and information costs, quality uncertainty, and limited market size create the conditions for oligopsony. Peterson (1973), Ph.D. in anthropology from the University of Hawaii, observed the auction daily for a year and concluded that social arrangements among dealers had less of a discriminatory intent (and effect) than that they were an attempt to dampen a highly volatile market. The relatively small size of the larger wholesale seafood firms seems to have assisted in maintaining an adaptable marketing environment, developing specialty and export markets, and in promoting price premiums for high

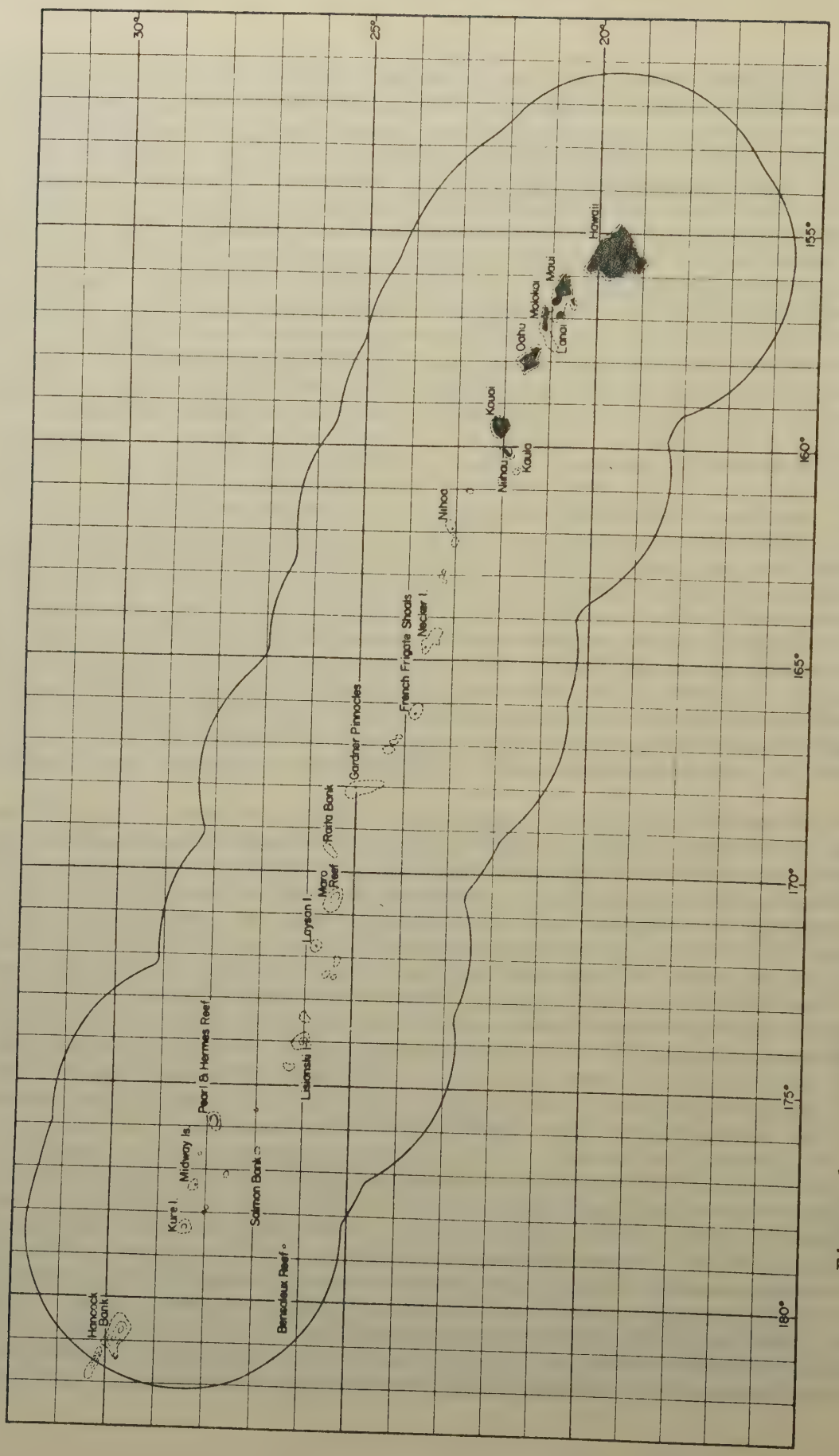

Figure 1.--The Hawaiian Archipelago including the Northwestern Hawaiian Islands.

quality fresh fish (Cooper and Pooley[1]). However, the geographical isolation of Hawaii and the limited scope of its fishing resources seem to have reemphasized the small-scale nature of the market as faced by the harvesting sector.

Although within the framework of this analysis one could view the operation of the tuna cannery as the intrusion of large-scale capital into a small business environment, such an effect seems to have been limited. In the first place, the cannery purchased only from one sector of the local fishery (the pole-and-line aku boats), and that sector has increasingly sold a major share of its catch on the fresh market. Second, the cannery itself is small by processing facility standards, handling approximately 30,000 metric tons of skipjack tuna annually (of which 75% is imported from foreign or mainland U.S. fleets operating throughout the Pacific). Its smallness apparently saved Hawaiian Tuna Packers (Bumble Bee Seafoods, Inc.) from closing in 1983 when its owner, Castle and Cooke (a multinational food conglomerate founded in Hawaii as a sugar and pineapple company) decided to close a larger mainland cannery because the latter would create a greater immediate cash flow. Furthermore, the existence of the cannery has provided a larger infrastructural base through which shoreside facilities (such as ice and dry docking) have been made available. Naturally, given their sole source and Hawaii's isolation, there have been controversies on the availability and pricing of these facilities. However, for many years the cannery sustained a paternal relationship with the local commercial fishery. Recently this has broken down and in the context of current fisheries development planning in Hawaii, the cannery's ownership makes it stand apart from the more local concerns of the rest of Hawaii's fishing industry. This has been particularly true with the growth of the North Pacific albacore, T. alalunga, fishery hundreds of miles off Midway (at the northwestern tip of the Hawaiian Islands chain) and the U.S. purse seine fishery throughout the central and South Pacific. In any case, tuna cannery operations throughout the United States seem to be threatened and prosaic business practices are changing the exceptionalist nature of this representative of large-scale capital in Hawaii.

If one charts the real value of commercial landings in Hawaii over the last 31 years, it is apparent that small was not beautiful, since the commercial fishery was dying in the 1960's and early 1970's (Fig. 2). A combination of factors meant that the old practices simply could not endure. By 1975 when local commercial fishing had begun to pick up again (probably because of the market impact of Hawaii's tourism industry growth), the State Government was looking to diversify Hawaii's economic base. Tourism and military employment provided over half of the primary income to the people of Hawaii, and long-time industries like sugar and pineapple were being phased out. Furthermore, with the maturation of the local economy, investment by the "Big 5" sugar and pineapple companies was

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[1]Cooper, J. C., and S. G. Pooley. 1983. Characteristics of Hawaii's wholesale seafood market. Southwest Fish. Cent. Honolulu Lab., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812, Admin. Rep. H-83-22, 33 p.

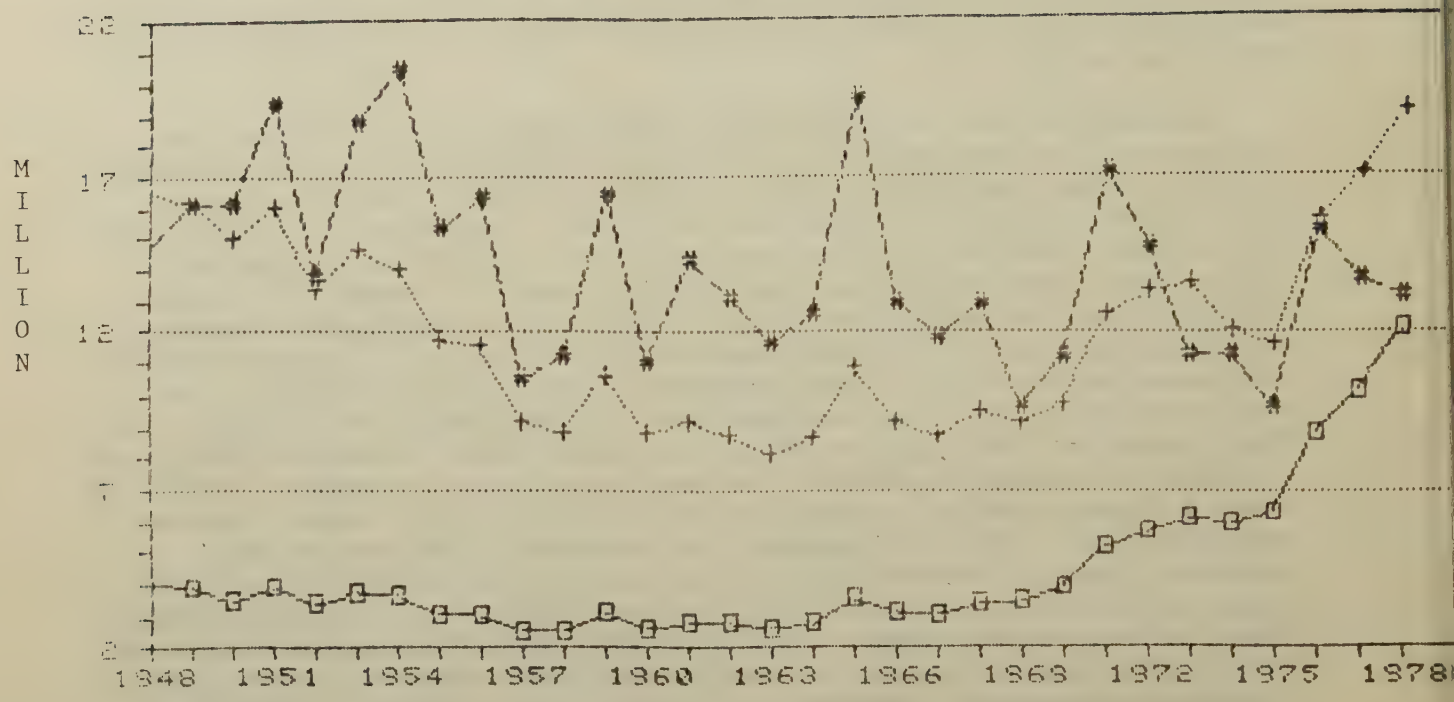

Figure 2.--Hawaii commercial fishing revenue 1948-72 (□ = value in millions of dollars; + = value adjusted for inflation in 1984 dollars; # = pounds in millions).

leaving the State while small-scale local entrepreneurs were emphasizing real estate and construction, the professions, services, etc. State Government began experimenting with a number of development projects. In fisheries a quasi Federal development board was formed to promote the region's tuna fisheries (the Pacific Tuna Development Foundation (PTDF)) and a State fishery development plan was prepared. This interest in alternative industries coincided with four scientific advances in fisheries: in-depth resource investigations of the NWHI; the initial deployment of fish aggregating devices (FAD's); the discovery of the North Pacific migratory route for albacore; and innovations in purse seine technology allowing access of the U.S. fleet to midocean tuna. The first suggested large untapped resources lay nearby; the second provided a means for increasing the access of small boat fishers to highly migratory offshore resources; and the latter two attracted mainland U.S. floating and financial capital.

The effect of these developments was to change the nature of the debate on Hawaii's fishing industry. Whereas in the 1960's and early 1970's the discussion was on the decline of the fishery, in the late 1970's private investment in commercial fishing seemed to be a feasible alternative for local investment capital. At the same time, conditions in mainland U.S. fisheries deteriorated to a sufficient degree that numbers of high

technology tuna vessels began coming to the western Pacific. Initially these visits were sponsored by PTDF and west coast troller associations, but later the research reports on the NWHI stimulated a separate migration of vessels and a new breed of fishing vessel operator directed not at cannery pack but at bottom fish and shellfish. Growing interest in "things Japanese" on the U.S. mainland provided the means for development of an export market for fresh tuna (ahi). By 1984, experience with fisheries development has shown promise and problems.

The implementation of the U.S. Magnuson Fishery Conservation and Management Act (MFCMA) in 1976 initiated a whole new regulatory climate for fisheries in the western Pacific which had not faced the same domestic user conflicts as those on the mainland U.S. The Western Pacific Regional Fishery Management Council (Council) created by the MFCMA added a new political actor in the discussion of viable means for developing Hawaii's commercial fisheries. While the Council made the familiar exclusionary moves against foreign fishing, its management interests have evolved into an emphasis on creating means for controlled development of untapped resources in the NWHI. As a pluralistic advisory body of definitely interested special interest groups, the Council has formed a new political locus in Hawaii's (and the U.S. western Pacific) fisheries. Meanwhile, Hawaii's Department of Land and Natural Resources (DLNR) was caught with fishery management regulations that had little scientific backing and decreasing enforceability. The advisory committee structure which guided DLNR's decision making was partitioned by island, rather than by fishery. The State's fishery development plan, PTDF, and the State's fishing vessel loan programs were promoting expansion of the fishery almost in isolation from the DLNR's management agency and frequently in conflict with the State's Harbor Division which was already suffering from competition over moorage space.

Politically, new demands were being generated against institutions which had been developed for monitoring fishing activities but not for maintenance, development, and allocation of natural resources and shoreside infrastructure. The new investment and in-migration of floating capital which have transpired in the past 10 years continue to press all governmental actors, from the State of Hawaii to the National Marine Fisheries Service, to respond to rapidly changing commercial and political conditions. Interestingly, one of the enduring structural changes of the Hawaii Fishery Development Plan was the establishment of an industry-wide advisory committee within DLNR. This committee provides the management agency with a more immediate hearing of its commercial fishery constituency and serves to organize these interests around a common axis.

ADVANTAGES OF SCALE

The advantages of large-scale production with fixed capital assets are fairly well known and relate to extending the downward sloping portion of the marginal cost curve. These are usually considered technical or engineering advantages, and, in a perfectly competitive, available information, costless transactions world, these advantages could be obtained by any firm

in time. Such a world does not exist and as a result oligopolistic dominance of markets and preferential access to loanable funds markets may also be considered advantages of large-scale operation. The presumed advantages of small-scale production usually involve the malleability of management and the productivity of unalienated labor. Further advantages may accrue due to malleability of smaller scale plants, although this advantage might be obtained under conditions of large business enterprise operating under decentralized management. The difference between scale of production and size of firm is relevant in the "is small beautiful?" framework for commercial fishing in Hawaii.

In a discussion of economies of scale, there is a general presumption that the capital-labor ratio is greater for large-scale firms. This seems to be corroborated in Hawaii's fishery, acknowledging that the difference between large- and small-scale firms may be simply between an individually owned $500,000 capital investment firm with five employees and an individually owned $50,000 investment firm with three employees. Similarly, differences in scale frequently are related to dual or segmented labor markets: the small-scale labor-intensive firms draw from a less educated or more discriminated labor pool, and the larger scale firms draw from a pool with deeper investment in human capital. Again, such would appear to be the case in Hawaii's fishery, if for no other reason than the larger vessels are more technically complex to operate. Thus the issues of scale involve a number of factors outside the immediate production process. The scale conditions considered in this paper include: harvesting capacity as a function of vessel size, financing capacity as a function of ownership assets, market capacity as a function of local demand, and labor conditions as related to crew size.

Five types of capital investment have been taking place in and around Hawaii's commercial fishery since 1975: visits by highly mobile fishing vessels from the west coast albacore fishery; in-migration of individual mainland U.S. fishers, usually with limited financial resources; upgrading of local fishing enterprises through internal investment; "joint venture" investments between local entrepreneurs (frequently wholesale fish dealers) and mainland vessel operators; and most recently, the movement of the U.S. southern California purse seine tuna fleet to the western Pacific (with bases in American Samoa and Guam). There has also been substantial investment in recreational and part-time fishing, apparently a substantial disinvestment in the skipjack tuna fishery, and rough times in the charter boat industry.

Hawaii's fisheries can be divided into two groups by the scope of financial resources applied to their harvest: The purse seine vessels and the "joint venture" vessels comprise the large capital sector; the albacore vessels and the rest of the vessels with local ownership comprise the small capital sector. The albacore and joint venture vessels have been able to have the quickest impact on the fisheries, but the effects have been unstable. The joint venture fisheries have targeted the frozen shellfish market to avoid the limitations of local demand. The spiny lobster fishery went from boom to bust in 3 years using external capital, and it appears ready to replicate its fate. The deep sea shrimp fishery was pioneered by

a small-scale fisherman and is now being developed in harvesting capacity and marketing with large-scale financing. Both fisheries have included Hawaii and mainland U.S. vessels. The purse seine fleet once was based in San Diego, but now may be considered migratory like the fish it seeks. Its impact in Hawaii has been on cannery operations and little impact has been seen on the local fishery unless it is through a Pacific-wide decrease in skipjack and yellowfin tuna stocks. It may also have affected the transient albacore fishery because the cannery has reduced its purchases of white meat tuna (albacore) and is concentrating again on light meat (skipjack tuna). The Midway albacore fishery is now much less of an option to the trollers who also are facing closed west coast canneries.

Small-scale capital, whether as vessels fished by long-time residents or that being prosecuted by relatively recent arrivals to Hawaii's fishery, is further divided by the range of the vessels, but it is combined by these vessels' reliance on the same domestic market. Range allows greater flexibility in harvesting alternative fishing grounds, but the newer (and more expensive) vessels are facing significant amortization costs which diminish their scope for collectively managing resources which was the hallmark of the older fishery in Hawaii. Their larger capacity also makes them more susceptible to revenue losses from short-term swamping of the fresh fish market. This dichotomy provides a competitive harvesting sector in the face of a contestable fresh fish market. As in agriculture, the individual producer tends to be at a bargaining disadvantage vis-a-vis the processing and marketing structure. The effect is that small may be morally beautiful, but it is a difficult way to earn a living.

Finally, the scale of Hawaii's fisheries may also be determined by their markets. The international markets are clearly of unbounded scope. These involve the frozen shellfish sector and the cannery market for albacore and skipjack tuna. The problems facing the albacore trollers and the local pole-and-line aku boats are international problems of low value-added commodity production. The bottom fish, yellowfin and bigeye tunas, and the fresh shellfish markets are limited by the absorption of the local market and the perishability of the product. Whereas the largest scale capital utilizes the international market, the medium- and small-scale capital is frequently involved in both markets. For the fresh fish markets, especially exports, Hawaii's wholesale dealers play a pivotal role in fisheries development.

The "joint venture" operations in Hawaii are examples of modern industrial society at its apogee: highly liquid capital seeking short-term useful employment. The vessels are able to move from the U.S. mainland and Alaska to Hawaii and even into other areas of the Pacific. The owners may well be absentee investors and the operators and crews are frequently, but not always, nonresidents of Hawaii. Local fishers, including recent immigrants from the U.S. mainland, are extremely concerned that these ventures will generate short-term benefits at the cost of long-term resource losses throughout the NWHI. In this case it is not only the scale of capital that matters but its mobility. It is the narrowness of the resource base in the main islands and NWHI which makes such large-scale operations frequently destructive of long-term commercial development. However, it is also the

case that the development of the lobster and shrimp resources of the NWHI has required this infusion of outside capital, and here the trade off is more familiar to fisheries economics--when does overcapacity in a common property resource situation become a binding constraint? The major advantage of joint venture operations in Hawaii is their mobility: They can either leave the fishery or prosecute a boom-bust strategy. They have also avoided direct market competition with the local fishery by concentrating on exports of frozen product.

Politically the tuna canneries in American Samoa and Hawaii have enjoyed wide latitude in their operations and represent the highest level of financial liquidity. However, it is the canneries' evolving relationship with the U.S. purse seine fishery which is changing the status of Hawaii's cannery. The U.S. purse seine fleet in the South Pacific is now utilizing Hawaii as one of its bases. This has meant more employment at the tuna cannery and at other shoreside facilities, and the net benefit to Hawaii may be significant. Its impact on the local fishery seems limited. The purse seine fishery may be reducing the average size of skipjack tuna schools, and the fleet may be having a marginal impact on local commercial aku vessels through competition for shoreside resources. However, the purse seine fishery is seen as a means to protect the existence of the cannery whose closure might cause half the remaining local aku vessels to go out of business. Therefore the cost to the local fishery of competition with the purse seiners is undoubtedly seen as offset as long as the purse seiners' increased landings help the cannery continue to operate. If the cannery begins to use a seasonal schedule in accord with the purse seine fishery, then the benefit to the local fishery may decline substantially. In this case, conflict between differing interests based on scale of capital will probably surface.

The albacore fleet, still based on the west coast, is an example of highly mobile, capital intensive, but small-scale capital. The bankruptcies that have plagued many sectors of the U.S. fishing fleet are also barometers to this fishery. But from Hawaii's point of view, they might be termed "medium scale" and lie between the large and small capital sectors. Like the joint venture arrangements, the albacore vessels have been able to exploit some nonalbacore resources in Hawaii. Unlike the joint ventures, they have been competing directly in the domestic fresh fish market with this alternative harvest. Politically the albacore trollers have also attracted attention, although here it might be considered a demonstration effect. As a well organized group, the west coast albacore trollers were able to lobby the State Government for improved short-term berthing and other advantages. The net economic value of these transient vessels was considered substantial, although the initial effect was primarily a spin off. In time up to 20 albacore vessels permanently moved to Hawaii, and an increased rationale was made for their support. Ironically, a feasibility plan for the development of a fishing station at Midway to support the albacore trollers has been set aside while Hawaiian Tuna Packers concentrates on canning light meat tuna captured in the U.S. purse seine and foreign fishery. The prerogatives of the conglomerate-owned canneries have meant significant adjustment problems for small-scale enterprises.

The smallest scale vessels are the handline vessels that work the main Hawaiian Islands. These commercial vessels are matched in interests with medium and large handline vessels working the NWHI and selling to the same fresh fish market in Honolulu. The harvesting capacity and production technology of the small-scale full-time commercial handline vessels are little different from those of the part-time and recreational vessels. Estimates of recreational and subsistence landings indicate that the overall pressure on the bottom fish resource may be double that suggested by the commercial landings alone. A vessel inventory and classification survey of all registered boat owners in Hawaii showed that there were approximately 5,000 commercial and recreational fishing boats in the State.[2] Of these, 3,600 reported they sold none of their catch, and only 151 reported earning over half their gross income from fishing. The result is substantial resource and market competition between the two classes of small-scale handline vessels. Other types of small-scale vessels, especially the longline, pole-and-line, and net boats, seem unaffected by this problem.

In an "is small beautiful?" framework, the competitive pressure of the much larger number of primarily recreational vessels is raising the per unit operating cost to commercial handline boats. The net economic benefits may be greater to the recreational fishery, but the effect is to drive midsized handline vessels farther north and to drive small handline boats out of bottom fishing altogether. Individual commercial vessel owners are either incapable of attracting sufficient capital to stay in the fishery or they are taking on relatively large loans (between $150,000 and $3,000,000) to exploit the NWHI as a multispecies fishery. The effect of this is to move them into an even more competitive financial environment or to force them into joint ventures where outside capital is deeper, but where they must share investment and operating decisions. From a consumer's point of view the situation may be desirable, since the part-time and recreational boats are able to maintain a fairly consistent supply of small bottom fish (from an overharvested resource) at relatively moderate prices. For restaurants which rely on larger bottom fish, this may be a problem, particularly if supply becomes inconsistent as the NWHI bottom fish and fresh shellfish resources are overfished through the impact of financial pressure on harvesting patterns. Thus a trade off has already developed: Lifestyle benefits are winning out over small-scale commercial harvesters of Hawaii's main island bottom fish resources, and measures to diminish this advantage seem unlikely at this time. The plurality of thousands of recreational and subsistence fishers probably will outweigh the old style commercial fishers and may even do so if conflict comes between the plurality and the commercial tuna handliners.

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[2]Skillman, R. A., and D. K. H. Louie. 1984. Inventory of U.S. vessels in the central and western Pacific. Phase 2--Verification and classification of Hawaiian vessels. Southwest Fish. Cent. Honolulu Lab., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812, Admin. Rep. H-84-12, 21 p.

Concerning the cannery, the local aku pole-and-line fishery is in much the same situation as the albacore boats. Their owners created the one enduring cooperative in Hawaii's fishery, largely to negotiate with Hawaiian Tuna Packers over the price of cannery sales and to market their fresh catch. The pole-and-line boats have an advantage over the albacore vessels of being able to sell their catch on the fresh fish market without directly competing against other local fishers, and their revenues from fresh sales have risen substantially over the past 10 years. However, the aku boats are much more labor-intensive and have no capital mobility whatsoever. They are plagued with "fuel costly" search patterns and "time costly" baiting problems. Although it still produces almost 50% of the State's landings, the economic future of the pole-and-line fishery is clearly in doubt. They seem to have all of the disadvantages of small scale and few of the advantages.

Finally, Hawaii's longline tuna vessels may actually be an example of "small is beautiful." By exploiting a highly migratory stock with high per unit values (the average price for fresh yellowfin tuna was $1.50 per pound in 1983, and prices reached $8.00 during periods of peak demand), the small and medium-sized longline vessels are undergoing a period of reinvestment and refurbishment. Not only has the market expanded through export sales of fresh yellowfin and bigeye tunas, but the vessels are also relatively fuel efficient. The entry of a number of new and converted vessels in this fishery allows a presumption of profitability. Whereas in 1975 there may have been <15 longline vessels, by 1984 there may be as many as 45. The vessels have been able to avoid the constraints of the narrow resource base base faced by handline vessels and at the same time face an expanding international market for fresh ahi. Although little is known about the current ownership and labor conditions on these vessels, they are neither highly "capital-costly" (on average) nor are they they labor-intensive. Interestingly, their recent development seems to have occurred within the interstices of management and development planning in Hawaii, perhaps indicating the irrelevance of scale in growth situations.

This summary of economic conditions in these five Hawaii fisheries points out the underlying structural factors affecting large- and small-scale vessels and fishing enterprises. One of the presumed advantages of small-scale operation is flexibility. Flexibility in harvesting only exists when alternative resource bases exist, and even these may be stressed by the common property problem. Flexibility is also limited by marketing constraints and by access to working capital during seasonal downturns in production or prices. Ironically, marketing is also a problem for the larger scale purse seine and albacore fisheries. Although small-scale operation seems to be a valuable possibility where income considerations are secondary (i.e., in part-time commercial operations), it seems that economic forces will have to be moderated wherever binding resource or marketing constraints exist.

CONCLUSIONS

By almost any criterion, Hawaii's historical fisheries were small scale in harvesting and financial capital and in resources and markets.

Industry and government experience in Hawaii has been with this mode of production and changing management styles may be difficult. Certainly this has been true in other sectors of Hawaii's political superstructure. There is a sentiment in Hawaii that the islands' fisheries should be left to local people which is not an unfamiliar refrain throughout the United States. The economic problem has been that the familiar danger of open access fisheries is compounded by the mobility of large mainland U.S. vessels moving into Hawaii and the immobility of small Hawaii-based vessels. The adjustment costs to the local community may well exceed the short-term benefits gained by or from transient vessels but there has been little political recourse given constitutional prerogatives concerning restraint of trade. Protectionism and local content laws are usually viewed by economists as means for subsidizing one part of a community at the cost of another (usually consumers and competitors). As a result, the benefits of Hawaii's fisheries development may go to the outside investors and thus not provide an alternative to the current structure of primary industry in Hawaii.

However, limited entry schemes may provide a means for allocating access to natural resources in a way conducive to optimal capital utilization and social development. Discussion has just begun in Hawaii on such a possibility, but it does seem to be the only means for maintaining small business enterprises against the incursions of really large-scale capital. The latter has a wider range of opportunities, not only within fisheries but outside as well. Examples abound, not the least being U.S. Steel's purchase of Marathon Oil, or Castle and Cooke's sale of Hawaiian Tuna Packers in favor of more stable profit centers.

Two contradictions exist. First, most of the outside capital applied to Hawaii's fishing industry is really rather small compared to mainland U.S. standards or compared to tourism and real estate development in Hawaii. Second, as odious as the arrival of more and more new vessels from the U.S. mainland seems to many, it is clearly the primary source of new investment and harvesting capacity in Hawaii's fishery. It is also a source of technology transfer and new fishing skills. The expansion of the fishery has been well received by the processing and marketing sector and increasingly by the State Government which sees increased tax revenue from these vessels. The familiar problem of the distribution of benefits among small-scale operators is not solved by excluding one class of small capital owner.

The issue concerns allocation of a public resource. A division of Hawaii's fishery into three zones might well meet the objectives of capital and the public. The main Hawaiian Islands might be reserved for small-capacity vessels; the Northwestern Hawaiian Islands might be available on a limited entry basis for large- and medium-scale vessels; and midwater pelagic resources (the skipjack tuna and large tunas) might be freely available. Allocation might also be judged on whether the catch was destined for the fresh or frozen market. These simple proposals would not solve all the problems of Hawaii's fisheries, but they might promote self-management of the area's fisheries while at the same time allowing highly mobile fishing vessels access to resources. If there are

substantial life-style benefits accruing from small-scale participation in the nearshore fisheries, it seems foolish to trade these for technically efficient, large-scale production. It is also foolish to sacrifice small-scale commercial fisheries to recreational and part-time commercial fishing on the one hand and to highly capitalized fishing on the other as long as a market exists for those small-scale commercial fisheries. Consumers should benefit from the diversity of seafood sources this system would continue and from the competitive pressure on prices this system would maintain.

Although to some extent fisheries and fast food restaurants might be equitably viewed as similar (letting the free enterprise system allocate market shares among individual competitive businesses), the nonmarket values associated with small-scale fisheries might just as easily override the presumed efficiency of the market mechanism. These benefits are only thematic--commercial and part-time, subsistence, and recreational fishing nonpecuniary characteristics haven't been investigated--but their relevance is frequently articulated. Social control of fisheries involves a compromise in favor of community development and democratic solutions at the potential cost of discriminatory impacts on income possibilities. This being so, the political allocation of fishery resources will have to be carefully specified. Clearly this solution deviates from the "invisible hand;" however, the question is not "who is bigger," but "what is better?"

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